IN THE CLAIMS:

1. (Currently amended) An optical sensor for monitoring combustion processes in a combustion chamber, comprising:

a lens system ~~(1, 2)~~ facing the combustion chamber,

a waveguide [[(5)]] and

a sheath [[(4)]] surrounding the lens system and one end of the waveguide, wherein the lens system ~~(1, 2)~~ comprises at least one essentially plano-concave lens [[(1)]] and a double concave lens [[(2)]] wherein the planar face of the plano-concave lens [[(1)]] is exposed to the combustion chamber.

2. (Currently amended) A sensor according to claim 1 wherein the angular coverage of the lens system ~~(1, 2)~~ is at least in a range of 130° up to 140°.

3. (Currently amended) A sensor according to claim 1 wherein the lenses ~~(1, 2)~~ are composed of sapphire or quartz glass.

4. (Currently amended) A sensor according to claim 1 wherein at least the plano-concave lens [[(1)]] at its surface area is surrounded by a metal plating.

5. (Currently amended) A sensor according to claim 4 wherein the plano-concave lens [[(1)]] is fixed to the sheath [[(4)]] by means of a soldering material.

6. (Currently amended) A sensor according to claim 1 wherein the lens system ~~(1, 2)~~ has a maximum diameter of < 8 mm.

7. (Currently amended) A sensor according to claim 1 wherein the length of the lens system ~~(1, 2)~~ which has to be passed by the light is at most equal to the diameter of the lens system ~~(1, 2)~~.

8. (Currently amended) A sensor according to claim 1 wherein the outer diameter of the sheath [[(4)]] is at most 10 mm.

9. (Previously presented) A sensor according to claim 1 wherein the sensor can be assembled in a spark plug or in a heater plug.

10. (Currently amended) A sensor according to claim 1 wherein the slackness [[(3)]] between the outer radius of the lenses ~~(1, 2)~~ and the inner radius of the sheath [[(4)]] is less than 10 µm.

11. (Currently amended) A sensor according to claim 3 wherein at least the lens [[(1)]] facing the combustion chamber is fixed by means of a soldering material to the sheath [[(4)]].

12. (Currently amended) A sensor according to claim 1 wherein the sheath [[(4)]] is made of a material able to withstand a continuous temperature load of 600°C and a momentary temperature load of 950°C.

13. (Currently amended) A sensor according to claim 1 wherein the sheath [[(4)]] is made of a material having a coefficient of thermal expansion in the range of 0 to 400°C of less than $10.5 \cdot 10^{-6}\ K^{-1}$.

14. (Currently amended) A method for the centering of one or more lenses ~~(1, 2)~~ and a waveguide [[(5)]] in a sheath [[(4)]] of an optical sensor for the monitoring of combustion processes in a combustion chamber, said sensor comprising a lens system having at least two lenses, wherein the gap [[(3)]] between the outer radius of the lenses ~~(1, 2)~~ and the inner radius of the sheath [[(4)]] is less than 10 µm, and that the gap [[(3)]] is filled with a soldering paste and that the deviation of the axial orientation of the waveguide [[(5)]] and the lens system ~~(1, 2)~~ is less than 10 µm.

15. (Currently amended) The method according to claim 14 wherein a deep-drawn sheath [[(4)]] is used.

16. (Cancelled)

17. (Currently amended) The method according to claim 14, wherein the sensor consists of at least a lens system ~~(1, 2)~~ facing the combustion chamber, a waveguide [[(5)]] and a sheath [[(4)]] surrounding the lens system and one end of the waveguide wherein the lens system ~~(1, 2)~~ comprises at least one essentially plano-concave lens [[(1)]] and a double concave lens [[(2)]] and wherein the planar face of the plano-concave lens [[(1)]] is exposed to the combustion chamber.

18.- 20. (Cancelled).

21. (Currently amended) The method according to claim 17, wherein the plano-concave lens [[(1)]] is fixed to the sheath [[(4)]] by means of a soldering material.

22.-24. (Cancelled).

25. (Previously presented) The method according to claim 17, wherein the sensor can be assembled in a spark plug or in a heater plug.

26. (Cancelled).

27. (Currently amended) The method according to claim 14, wherein at least the lens [[(1)]] facing the combustion chamber is fixed by means of a soldering material to the sheath [[(4)]] in the area of the gap [[(3)]].

28.-29. (Cancelled).